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**Osmosis in Elodea Lab**

Pre-AP Biology, Mrs. Krouse

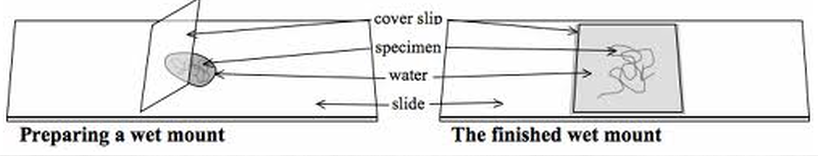


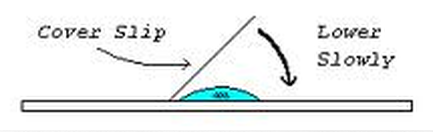
**Overview:** In this lab, you will be investigating how the cells of Elodea, a freshwater plant, are affected by a concentrated salt solution. You will be using a pipette (eye dropper) to drop the salt solution on a single leaf from an Elodea “spring.” Your leaf will be on a microscope slide so we can view the cells of the leaf up close and observe changes in the leaf.

Before we drop salt solution on the Elodea leaves, we will view the leaf cells with drops of fresh water on them so we can observe their natural state.

**Lab Procedure – Part A:** Elodea in Fresh Water

1. Obtain the following materials for your group: safety goggles, a glass slide, a cover slip, and a paper towel
2. Pull one Elodea leaf off the sprig and place it on your glass slide. Use a pipette to place two drops of fresh water from the beaker containing the Elodea sprigs on top of your leaf. Lower the plastic cover slip down at an angle (see the images below) to create what we call a “wet mount” slide.

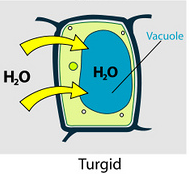
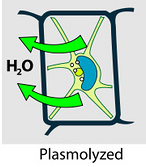




1. Place your slide on the stage of the microscope and secure with the stage clips. Make sure you are using the scanning objective lens (i.e., the shortest lens, which has a red ring around it) before you place the slide on the stage.
2. While on the scanning objective lens, use the coarse adjustment knob (the large one) to move the stage up and down to bring your specimen into focus.
3. Once your specimen is in focus with the scanning objective lens, rotate the nosepiece to switch to the low power objective lens (i.e., the mid-length lens, which has a yellow ring around it). You can still use the coarse adjustment knob CAREFULLY under low power, but you may find that the fine adjustment knob (the small one) is more helpful to bring your specimen into focus under low power.
4. Once your specimen is in focus with the low power objective lens, rotate the nosepiece to switch to the high power objective lens (i.e., the longest lens, which has a blue ring around it). You CANNOT use the coarse adjustment knob on high power. If you do so, you may break the slide or the lens! Use only the fine adjustment knob to bring your specimen into focus.

**Observations and Follow-Up Questions – Part A:** Elodea in Fresh Water

1. In the space given below, draw what you see under the microscope at high power. Use the markers at your table to include color.
2. What is the total magnification you are using to view your specimen? Explain how you determined this number.
3. Which organelles can you see in the Elodea cells? What do they look like? (You should describe two organelles.)
4. Do the Elodea cells appear to be turgid or plasmolyzed (see images below for reference)? How do you know based on their appearance?

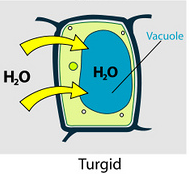
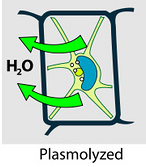
1. Based on your answer to #4, what type of solution (hypotonic, hypertonic, or isotonic) is the fresh water we have dropped on the Elodea cells? What does this type of solution do to cells? In other words, when cells are placed in this type of solution, does water enter or exit the cells and why? Use the terms “high water concentration” and “low water concentration” in your answer.

**Lab Procedure – Part B:** Elodea in Salt Water

1. Turn the nosepiece on your microscope to the scanning objective lens. Remove the slide from the stage.
2. Use paper towel to soak up some of the freshwater from around the leaf. Dry off your cover slip. Use a pipette to put two drops of salt solution onto your leaf. Lower the coverslip at an angle like you did in Part A to create your wet mount slide.
3. Follow steps 3-6 from Part A to focus your microscope to view the Elodea cells on your slide.

**Observations and Follow-Up Questions – Part B:** Elodea in Salt Water

1. In the space given below, draw what you see under the microscope at high power. Use the markers at your table to include color.
2. Do the Elodea cells appear to be turgid or plasmolyzed (see images below for reference)? How do you know based on their appearance?

1. Based on your answer to #2, what type of solution (hypotonic, hypertonic, or isotonic) is the salt water we have dropped on the Elodea cells? What does this type of solution do to cells? In other words, when cells are placed in this type of solution, does water enter or exit the cells and why? Use the terms “high water concentration” and “low water concentration” in your answer.

**Clean Up:** Follow the directions below to clean up your lab station.

1. Turn the nosepiece on your microscope to the scanning objective lens. Remove the slide from the stage.
2. Turn off the lamp on the microscope. Unplug the microscope (last class only).
3. Remove the cover slip and leaf from your slide. Throw them in the trash can. Rinse your slide off and dry it thoroughly with a paper towel. Return your slide to the box where you got it, and return your safety goggles to the white goggles cabinet.